

Lowell Regional Wastewater 451 First Street Boulevard Lowell, MA 01854 Attn: Tom Kawa

August 11, 2017

Dear Mr. Kawa,

Enclosed please find the toxicological evaluation and chemical analyses report for the effluent sample received on July 10th, 2017. This is your third quarter 2017 bioassay. Please call me at (401) 353-3420 if you have any questions.

Sincerely,

Michael McCallum Technical Laboratory Director

NEW ENGLAND TESTING LABORATORY, INC.

59 Greenhill St., West Warwick, RI 02893 (401) 353-3420 TOXICOLOGICAL EVALUATION AND CHEMICAL ANALYSES OF EFFLUENT: NPDES Permit # MA0100633 Third Quarter 2017 Sample Lowell

> Prepared For: Lowell Regional Wastewater 451 First Street Boulevard Lowell, MA 01854

> > August 11, 2017

By
New England Testing Laboratory, Inc.
59 Greenhill Street
West Warwick, Rhode Island 02893

NETLAB CASE NUMBER: 7G10069



CHRONIC AQUATIC TOXICITY TEST REPORT

Lowell Regional Wastewater Utilities Lowell, Massachusetts

Ceriodaphnia dubia Survival and Reproduction Test – EPA 1002.0

EPA 821-R-02-013, "Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms", Fourth Edition

Test Start Date: _	7/11/17	
Test Period:	July 2017	

Report Prepared by:
New England Bioassay
A Division of GZA GeoEnvironmental, Inc.
77 Batson Drive
Manchester, CT 06040

NEB Project Number: 05.0044476.00

Report Date: August 7, 2017

Report Submitted to:

New England Testing Laboratories 59 Greenhill Street West Warwick, RI02893

Sample ID: Effluent

This report shall not be reproduced, except in its entirety, without written approval of New England Bioassay (NEB). NEB is the sole authority for authorizing edits or modifications to the data contained in this report. Test results relate only to samples analyzed. Please contact the Lab Manager, Kimberly Wills, at 860-858-3153 or kimberly.wills@gza.com if you have any questions concerning these results.

GEOTECHNICAL

ENVIRONMENTAL

ECOLOGICAL

CONSTRUCTION MANAGEMENT

77 Batson Drive Manchester, CT 06042 T: 860.643.9560 F: 860.646.7169 www.nebio.com

NEW ENGLAND BIOASSAY, A DIVISION OF GZA – EPA SUMMARY SHEET

Facility Name: Lowe		Test Start Date:	7/11/17
NPDES Permit Number	er:MA0100633	Outfall Number:	
Test Type Acute Chronic XModified (Chronic reporting LC50 values) 24-Hour Screening		Sample Type Prechlorinated XDechlorinated Unchlorinated Chlorinated	Sample Method _ Grab XComposite _ Flow-thru _ Other
_ 24-Hour Screening	_ Menidia _ Sea Urchin _ Selenastrum _Other	TRC conc. <u>0.010</u> mg/L	
(Receiving water na Alternate Surface W of the receiving water X Synthetic water pre reagent grade chemic Artificial sea salts m	ame and sampling location: ater of known quality and a er; (Surface water name:		-see COC) of the characteristics
	e (s): <u>7/9/17</u> <u>7/11/17</u>	<u>7/13/17</u>	
	is Tested (in%): $0 \le 6.25$ it Concentration): $\ge 100\%$		
Was effluent salinity ac	djusted? No If yes, to	what value? N/A ppt	
Reference Toxicant tes	t date: 7/5/17 Refe	erence Toxicant Test Accept	rable: Yes X No_
Age and Age Range of	Test Organisms < 24 ho	ours Source of Organism	s <u>NEB Lab</u>
	TEST RESULTS & Test Acceptab		
A. Synthetic Water Co Mean Control Survival		Mean Control Reproduction:	23.3 young/female
B. Receiving Water Co Mean Control Survival		Mean Control Reproduction:	25.4 young/female
C. Lab Culture Control Mean Control Survival		Mean Control Reproduction:	N/A
D. Thiosulfate Control Mean Control Survival	-	Mean Control Reproduction:	N/A
	Test Vari	iability	
,	er and Lower PMSD bound er and Lower PMSD bound		bounds high bounds X high

Permit Limits & Test Results

	<u>Limits</u>		Results
LC50	≥100%	LC50	>100%
		Upper Value	$\pm \infty$
		Lower Value	100%
		Data Analysis	
		Method Used	Graphical
A-NOEC	N/A	A-NOEC	100%
C-NOEC	monitoring only	C-NOEC	<6.25%
		LOEC	6.25%
IC25		IC25	3.72%
IC50	N/A	IC50	62.5%

PMSD Comparison Discussion (Test Variability/Sensitivity)

Reproduction

- _ 1. PMSD exceeds upper bounds. Test results are highly variable and may not be sensitive enough to determine the presence of toxicity at the permit limit concentration (PLC).
- 1a. Test results indicate the discharge is not toxic at the PLC. Test is not sufficiently sensitive and must be repeated within 30 days of the initial test completion date using fresh samples.
- _ 1b. Test results indicate the discharge is toxic at the PLC. Test results are considered acceptable and the test does not have to be repeated.
- X 2. The PMSD falls within the upper (47%) and lower (13%) bounds. Results are reportable.
- _ 3. PMSD falls below the lower bound test variability criterion. The test is very sensitive. The relative percent difference (RPD) between the control and each treatment was calculated and compared to the lower PMSD boundary
- _ 3a. The RPD values for each concentration fall below the lower bound. The differences observed in this test are considered statistically insignificant.
- __ 3b. The RPDs for the following concentrations are above the lower bound______ The results at these concentrations are considered statistically significantly lower than controls.

Concentration-Response Evaluation

Survival: No concentration-response curve – no mortality observed at any concentration.

Reproduction: The concentration-response relationship observed in this data set corresponds to the following item number in Chapter Four of "Method Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing (40 CFR Part 136)", EPA 821-B-00-004, July 2000: # 1 Ideal concentration-response relationship.

The concentration-response relationship was reviewed according to the above guidance document and the following determination was made:

Survival Reprod.

 \underline{X} 1. Results are reliable and reportable.

2. Results are anomalous. An explanation is provided in the body of the report.

2. Results are inconclusive. A retest with fresh samples is required. An explanation is provided in the body of the report.

Whole Effluent Toxicity Testing Report Conclusions and Notes

Client Name/Project: NET/Lowell Regional Wastewater Utilities Test Date: 7/11/17
Sample ID: Effluent
Your results were as follows:
Passed all whole effluent toxicity permit limits
☐ Failed the following permit limit(s): ☐ LC50 ☐ C-NOEC (monitoring only) Please proceed according to the instructions in your permit.
Original Test Invalid - Valid retest performed. Both test and retest results are attached.
 □ A retest using fresh samples must be performed within 30 days of the initial test completion date () due to the test condition described below. See next page for further explanation. □ Test Invalid due to: □ Diluent toxicity □ Synthetic control toxicity □ Test not sufficiently sensitive. PMSD exceeds upper bound. □ Results are inconclusive due to an unusual concentration-response relationship.
Available information is insufficient to determine whether this test passed or failed. Please compare results to your permit limits. Please submit a current copy of your permit to the NEB Lab so that we can determine the status of future tests results and help ensure your compliance with permit requirements.
Additional testing for metals was required on the second and third effluent samples due to the following: ☐ Renewal sample(s) were of sufficient potency to cause lethality to 50% or more of the test organisms as follows: Effluent #: ☐ 2 ☐ 3 Concentration: ☐ 6.25% ☐ 12.5% ☐ 25% ☐ 50% ☐ 100% ☐
Diluent Toxicity:
☐ Testing ☐will be or ☐has been performed according to the Case 1 Protocols outlined in the attached copy of EPA-New England's species-specific, self-implementing policy for alternate dilution water.
Retesting will be or has been performed according to the Case 1 Protocols outlined in the attached copy of EPA-New England's species-specific, self-implementing policy for alternate dilution water.
This is your case of dilution water toxicity. Please proceed according to the Case 2 Protocols outlined in the attached copy of EPA-New England's species-specific, self-implementing policy for alternate dilution water. The alternate dilution water you select for future tests for this species should be described as follows: "synthetic laboratory water made up according to EPA's toxicity test protocols, by adding specified amounts of salts into deionized water in order to match the hardness of our receiving water." Writing this letter should help you to avoid retests in the future.
Sampling Requirements: A minimum of 3 samples were collected. Yes. □ No. See explanation on next page.
Samples were first used within 36 hours of collection. Yes. No. See explanation on next page.
<u>Dechlorination Procedures</u> : Chlorine was measured using 4500 CL-G DPD Colorimetric Method. ☑ Dechlorination was not required.
Sample was dechlorinated to mg/L by adding sodium thiosulfate to the sample prior to test initiation. A dechlorinated control of diluent water spiked with sodium thiosulfate equal in proportion to the amount added to the effluent sample was included in the test series.
Chlorine elevated due to interference. Chlorine was mg/L after interference check.
Total Residual Chlorine was re-measured following aeration, and was found to be mg/L.

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION (Permittee)

I certify under penalty of law that this document and all ATTACHMENTS were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on	[Date]	[Authorized Signature]
		[Print or Type Name and Title]
		[Print or Type the Permittee's Name]
		[Print or Type the NPDES Permit No.]

Since the WET test and report check is complicated, the New England Bioassay Aquatic Toxicity Laboratory has certified the validity of the WET test data in the section below. Please note that this does not relieve the permittee from its responsibility to sign and certify the report under 40 C.F.R. S 122.41(k).

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION (Bioassay Laboratory)

I certify under penalty of law that this document and all ATTACHMENTS were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on

Kim Wills, Laboratory Manager

[Print or Type Name and Title]

New England Bioassay

[Print or Type Name of Bioassay Laboratory]

24. Telephone Contacts

If you have questions, please contact Joy Hilton, Water Technical Unit, at (617) 918-1877 or David McDonald, Ecosystem Assessment Unit, at (617) 918-8609.

NEW ENGLAND BIOASSAY TOXICITY DATA FORM

	CHRC	ONIC COVER SHI	EET	
	New England Testing Laboratory		C.dubia TEST ID#	17-1015
_	9 Greenhill Street		COC #	c37-2675/76
_	West Warwick, RI 02893		PROJECT #	05.0044476.00
_	Lowell RWF Effluent			
DILUTION WATER: L	Laboratory Synthetic Soft Water			
		INVERTEBRATES		
	TEST SET UP (TECH INIT)	TBP		
	-	Ceriodaphnia dubia		
	NEB LOT#	Cd17(123 S)		
	AGE _	< 24 hours		
NO	TEST SOLUTION VOLUME (mls) ORGANISMS PER TEST CHAMBER	15		
	ORGANISMS PER CONCENTRATION	10		
	_			
	Labor	ratory Control Water (S)	RCE)	
	Lauoi	ratory Control Water (5)		
	Batch Number	Hardness mg/L	Alkalinity mg/L	
		CaCO ₃	CaCO ₃	
	C37-S013	46	30	
		D.A. III.		
		DATE	TIME	
	TEST START:	7/11/17	1118	
	TEST END:	7/17/17	1111	
	Results of C	Ceriodaphnia dubia C	hronic Test	
			95% Confidence	
			Limits	
	Г			
	48 Hour LC50	>100%	100%±∞	
	7 Day LC50	>100%	100%±∞	
	Survival NOEC	100%		
	Survival LOEC	>100%		
	Reproduction NOEC	<6.25%		
	Reproduction LOEC	6/25%		
	Reproduction IC ₂₅	3.72%		
MODE NO ODSERV	VABLE EFFECT CONCENTRATION		SEDVADI E EFFE	TONCENTO AT
NOEC. NO OBSEK	VADLE EFFECT CONCENTRATIO	LUEC, LUWEST UB	BERVADLE EFFE	JI CONCENTRATI
Comments:				
_				
	C 11/18 M			I = I

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NEW ENGLAND BIOASSAY - CHRONIC TOXICITY TEST BROOD DATA SHEET

FACILITY NAME & ADDR	RESS: Lowell	stewater 1	Utilities First Stre	et Boulevard, Lowell	, MA 0185	50	
NEB PROJECT NUMBER:	05.0044	1476.00	NEB T	EST NUMBER:	17-1015	COC#	c37-2675/76
TEST ORGANISM:	Ceriodaphnia dub	AGE:	<24 hours	Lot #	Cd17(123 S)		
START DATE:	7/11/17	TIME: 1	118	END DATE:	7/17/17	TIME:	1111

			Culture	e Lot#			Cd17	(123 S)							
	Cup#	В1	B2	В3	B4	B5	В6	B7	В8	В9	B10	Total Live	# Live	Analyst-	Analyst-
Effluent	Day					Rep	licate					Young	Adults	Transfer	Counts
Concentration	Number	Α	В	С	D	Е	F	G	Н	I	J				
	0	>	✓	✓	✓	✓	✓	✓	✓	✓	✓		10	TBP	
	1	\	✓	√	✓	✓	✓	✓	✓	✓	✓		10	КО	
	2	✓	✓	✓	✓_	✓	✓	✓	✓	✓	✓	0	10	CW	
NED V	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10	СВ	СВ
NEB Lab Synthetic	4	7	6	6	7	6	1	4	5	5	5 .	52	10	СВ	СВ
Diluent	5	8	8	11	11	AE	AE	9	12	✓	12	71	10	PD	PD
	6	19	15	19	18	√/AE	√/AE	11	15	√/AE	13	110	10	СВ	СВ
	7														
	totals	34	29	36	36	6	1	24	32	5	30	233	10		MG
		A	В	С	D	Е	F	G	Н	I	J				
	0	✓	✓	√	✓	✓	✓	✓	✓	✓	✓		10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	2	√	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
Merrimack River Control	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	4	5	5	4	7	6	7	5	6	6	5	56	10		
	5	13	18	12	12	13	13	12	13	12	16	134	10		
	6	3	6	8	6	5	13	7	✓	7	9	64	10		
	7														
	totals	21	29	24	25	24	33	24	19	25	30	254	10		
		Α	В	C	D	Е	F	G	Н	I	J				
	0		✓	✓	✓	✓	✓	✓	✓	✓_	✓		10		
	1		✓	✓	✓	√	✓	_ ✓	✓	✓	√		10		
	2		✓	_ ✓	✓	✓	✓	✓	✓	✓	√	0	10		
	3	✓	✓	√	✓	✓	✓	✓_	✓	✓	✓	0	10		
6.25%	4	5	4	✓	2	2	4	2	4	1	4	28	10		
	5	12	10	8	16	8	11	11	8	11	10	105	10		
	6	✓	✓	✓	✓	✓	✓	✓	2	✓	✓	2	10		
	7														Į.
	totals	17	14	8	18	10	15	13	14	12	14	135	10		

		_
Notes:		
	AE = aborted eggs noted	

NEW ENGLAND BIOASSAY - CHRONIC TOXICITY TEST BROOD DATA SHEET

FACILITY NAME & ADDRESS: Lowell Regional Wastewater Utilities First Street Boulevard, Lowell, MA 01850

NEB PROJECT NUMBER: 05.0044476.00 ORGANISM: Ceriodaphnia dubia START DATE: 7/11/17

TREST ROSEC															_
												Total	# Live	Analyst-	Analyst-
F.00	Day					Rer	olicate					Live	Adults	Transfer	Counts
Effluent Concentration	Number	A	В	С	D	E	F	G	Н	I	J	Young			
	0	√	1	1	√	1	1	1	√	1	1		10		
	1	√	1	√	/	1	1	1	√	/	V		10		
	2	√	√	1	√	1	1	√	√	1	V	0	10		
	3	√	√	V	√	1	1	1	√	1	1	0	10		
1	4	5	7	4	7	6	6	2	6	5	1	48	10		
12.5%	5	9	1	10	√	11	10	11	9	11	11	82	10		
l i	6	√	V	1	V	1	1	1	✓	1	√/x	0	9		
	7														
	totals	14	7	14	7	17	16	13	15	16	11	130	9		
		A	В	С	D	Е	F	G	Н	I	J				
	0	√	√	1	√	√	1	1	√	1	V		10		
	1	1	√	√	V	1	1	V	V	1	√		10		
	2	√	√	1	/	1	1	/	1	1	V	0	10		
	3	√	√	1	√	√	1	4	✓	1	√	4	10		
25%	4	5	4	V	4	3	1	1	5	4	4	29	10		
	5	12	2	10	10	14	4	7	9	8	6	82	10		
	6	√	√	1	1	1	1	3	1	/	√	7	10		
	7														
	totals	17	6	11	15	18	4	14	15	12	10	122	10		
		A	В	С	D	Е	F	G	Н	I	J				
	0	√	√	√	√	√	1	√	√	1	√		10		
	1	_	√	√	√	√	✓	1	√	V	√		10		
	2	√	√	√	√	√	1	√	√	V	√	0	10		
	3	√	√	4	√	√	1	√	√	1	√	4	10		
50%	4	6	5	√	3	3	√	5	5	6	√	33	10		
	5	12	12	10	12	6	12	10	9	10	11	104	10		
	6	√	√	√/x	√	√	√	√	2	√	√	2	9		
	7														
	totals	18	17	14	15	9	12	15	16	16	11	143	9		
		A	В	С	D	Е	F	G	Н	I	J				
	0	1	√	1	1	1	V	√	√	√	1		10		
	1	√	1		10										
	2	√	√	√	√	1	√	1	√	√/x	√	0	9		
	3	/	√	√	√	√	1	√	√	Х	√	0	9		
100%	4	3	2	3	3	4	4	6	4	Х	2	31	9		
	5	4	4	4	√	6	5	4	4	Х	4	35	9		
	6	1	√	1	√	4	1	1	√	Х	√	5	9		
	7														
			6	7	3	14	10	10	8	0	6	71	9		

Report Date: Test Code: 18 Jul-17 09:24 (p 1 of 6) 17-1015 | 13-8504-4918

										Tes	t Code:		1	17-1015 13	3-8504-491
Cerioda	phnia 7	-d Survival and	d Reproduc	ction T	est								No	ew Englan	d Bioassa
Analysis	s ID:	14-6471-9849	End	point:	2d	Survival Rate	е			CE1	IS Versi	ion:	CETISv1	.9.2	
Analyze	d:	18 Jul-17 9:17	Ana	lysis:	Lin	ear Interpola	tion (ICPIN	١)		Offi	cial Res	ults:	Yes		
Batch ID	D: 1	8-0642-2767	Test	t Type:	Rei	production-S	urvival (7d)		Ana	lyst:				
Start Da		1 Jul-17 11:18		ocol:		A/821/R-02-(-	Labo	ratory Wat	er	
		7 Jul-17 11:11		cies:		riodaphnia di	, ,			Brin			Applicable		
Duration		d	Sou			House Cultur				Age		<24h			
		7-9925-5940			6D	3E7784						Maur	England T	aatina Laba	
Sample		7-9925-5940 9 Jul-17	Cod	erial:		ντε Effluent				Clie		IACM	England 1	esting Labs	,
		9 Jul-17 0 Jul-17 16:15	Sou			well RWWU		33/		PIO	ject:				
	Age: 5		Stat		LOV	Well KVVVV	(NIAO I OOO	JJ)							
			Stat	1011.											
		ation Options					E 0.50	, aı	B.O 41-						
X Transf	torm	Y Transform				samples	Exp 95%	6 CL	Meth		- alatian				
_og(X)		Linear	1148	0000	200	,	Yes		I WO-	Point Inter	Joiation				
oint Es	stimates	•													
_evel	%	95% LCL	95% UCL	TU		95% LCL	95% UCL								
_C50	>100	n/a	n/a	<1		n/a	n/a								
2d Survi	ival Rat	e Summary					Calc	ulated	l Varia	te(A/B)					
Conc-%		Code	Count	Mean		Min	Max	Sto	l Err	Std Dev	CV%		%Effect	Α	В
)		D	10	1.000	0	1.0000	1.0000	0.0	000	0.0000	0.00%	, o	0.0%	10	10
3.25			10	1.000		1.0000	1.0000		000	0.0000	0.00%		0.0%	10	10
2.5			10	1.000		1.0000	1.0000		000	0.0000	0.00%		0.0%	10	10
4			10	1,000		1.0000	1.0000		000	0.0000	0.00%		0.0%	10	10
25			10	1.000		1.0000	1.0000		000	0.0000	0.00%		0.0%	10	10
50			10	1.000		1.0000	1.0000		000	0.0000	0.00%		0.0%	10	10
100			10	1.000		1.0000	1.0000	0.0	000	0.0000	0.00%	· 	0.0%	10	10
	ival Rate	e Detail													
Conc-%		Code	Rep 1	Rep 2		Rep 3	Rep 4	Re		Rep 6	Rep 7		Rep 8	Rep 9	Rep 10
)		D	1.0000	1.000		1.0000	1.0000		000	1.0000	1.0000		1.0000	1.0000	1.0000
3.25			1.0000	1.000		1.0000	1.0000		000	1.0000	1.0000		1.0000	1.0000	1.0000
2.5			1.0000	1.000		1.0000	1.0000		000	1.0000	1.0000		1.0000	1.0000	1.0000
4			1.0000	1.000	0	1,0000	1.0000	1.0		1.0000	1.0000		1.0000	1.0000	1.0000
25			1.0000	1.000	0	1.0000	1.0000	1.0	000	1.0000	1.0000	0	1.0000	1.0000	1.0000
50			1.0000	1.000	0	1.0000	1.0000	1.0	000	1.0000	1.0000	0	1.0000	1.0000	1.0000
00			1.0000	1.000	0	1.0000	1.0000	1.0	000	1.0000	1.0000	0	1.0000	1.0000	1.0000
d Survi	ival Rate	e Binomials													
Conc-%		Code	Rep 1	Rep 2	2	Rep 3	Rep 4	Re	o 5	Rep 6	Rep 7	•	Rep 8	Rep 9	Rep 10
)		D	1/1	1/1		1/1	1/1	1/1		1/1	1/1		1/1	1/1	1/1
3.25			1/1	1/1		1/1	1/1	1/1		1/1	1/1		1/1	1/1	1/1
12.5			1/1	1/1		1/1	1/1	1/1		1/1	1/1		1/1	1/1	1/1

002-570-915-7

25

50

100

1/1

1/1

1/1

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CETIS™ v1.9.2.4 9 of 26

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Analyst:_____ QA:____

1/1

1/1

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1/1

1/1

Report Date:

18 Jul-17 09:24 (p 2 of 6)

Test Code:

17-1015 | 13-8504-4918

Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

Analysis ID: Analyzed:

14-6471-9849

Endpoint: 2d Survival Rate

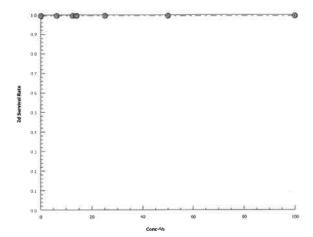
CETIS Version: CETISv1.9.2

18 Jul-17 9:17

Linear Interpolation (ICPIN) Analysis:

Official Results: Yes

Graphics



Analyst:___

Report Date: Test Code: 18 Jul-17 09:24 (p 3 of 6) 17-1015 | 13-8504-4918

Cerioda	phnia	7-d Survival and	d Reproduc	ction Te	est					Ne	ew Englan	d Bioassa
Analysi	s ID:	07-2696-3310	End	point:	6d Survival Rate	е		CET	IS Version	n: CETISv1	.9.2	
Analyze	ed:	18 Jul-17 9:17	Ana	lysis:	Linear Interpola	tion (ICPIN)	Offic	cial Result	t s: Yes		
Batch II	D:	18-0642-2767	Test	Туре:	Reproduction-S	urvival (7d)			lyst:			
Start Da	ate:	11 Jul-17 11:18	Prot	ocol:	EPA/821/R-02-	013 (2002)				boratory Wat	er	
Ending	Date:	17 Jul-17 11:11	Spe	cies:	Ceriodaphnia d	ubia		Brin	e: No	ot Applicable		
Duratio	n:	6d	Sou	rce:	In-House Cultur	re		Age	: <2	24h		
Sample	ID:	17-9925-5940	Cod	e:	6B3E7784			Clie	nt: Ne	ew England T	esting Labs	1
Sample	Date:	09 Jul-17	Mate	erial:	WWTF Effluent			Proj	ect:			
Receipt	t Date:	10 Jul-17 16:15	Sou	rce:	Lowell RWWU	(MA010063	3)					
Sample	Age:	59h	Stat	ion:								
inear l	nterpo	lation Options										
X Trans	form	Y Transform	See	d	Resamples	Exp 95%	CL Met	nod				
Log(X)		Linear	1206	5121	200	Yes	Two	-Point Interp	olation			
Point E	stimat	es										
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
LC50	>100	n/a	n/a	<1	n/a	n/a						
d Surv	vival R	ate Summary				Calcu	lated Varia	ite(A/B)				
Conc-%		Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	Α	В
)		D	10	1.000		1.0000	0.0000	0.0000	0.00%	0.0%	10	10
5.25			10	1:000	0 1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
12.5			10	1.000	0 1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
14			10	1.000	0 1.0000	1,0000	0.0000	0.0000	0.00%	0.0%	10	10
25			10	1,000	0 1,0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
50			10	1.000	0 1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
100			10	1.000	0 1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
d Surv	ival R	ate Detail										
Conc-%		Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
)		D	1.0000	1.000	0 1.0000	1.0000	1.0000	1.0000	1.0000	1,0000	1,0000	1.0000
3.25			1.0000	1,000	0 1.0000	1.0000	1.0000	1,,0000	1,0000	1.0000	1.0000	1.0000
2.5			1.0000	1.000	0 1.0000	1,0000	1.0000	1.0000	1.0000	1,0000	1.0000	1.0000
4			1.0000	1.000	0 1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25			1.0000	1.000		1,0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50			1.0000	1.000		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100			1.0000	1.000		1.0000	1.0000	1:0000	1.0000	1.0000	1.0000	1.0000
d Surv	rival Ra	ate Binomials										
Conc-%		Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
)		D	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
			1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
5.25				1/1		1/1	1/1	1/1	1/1	1/1	1/1	1/1
			1/1	17.1	1/1	17 1	17.1	17.1				
12.5									1/1	1/1		1/1
5.25 12.5 25 50			1/1 1/1 1/1	1/1 1/1 1/1	1/1 1/1 1/1	1/1 1/1	1/1 1/1 1/1	1/1 1/1 1/1			1/1	

002-570-915-7 CETI\$ ₹Mot/2@.2.4 Analyst:_____ QA:_____

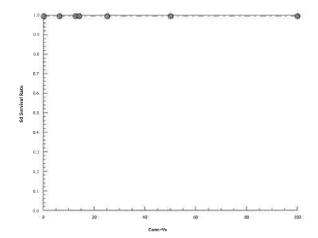
Report Date: Test Code: 18 Jul-17 09:24 (p 4 of 6) 17-1015 | 13-8504-4918

Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

Analysis ID:07-2696-3310Endpoint:6d Survival RateCETIS Version:CETISv1.9.2Analyzed:18 Jul-17 9:17Analysis:Linear Interpolation (ICPIN)Official Results:Yes

Graphics



Report Date: Test Code: 18 Jul-17 09:24 (p 5 of 6) 17-1015 | 13-8504-4918

Coriodani												
Ceriodapi	nnia 7-d	Survival and	d Reproduc	tion Te	est					N	ew England	d Bioassa
Analysis I	D : 19-	0401-1144	End	point:	Reproduction			CET	IS Versio	n: CETISv1	.9.2	
Analyzed:	18	Jul-17 9:20	Anai	ysis:	Linear Interpola	tion (ICPIN)		Offic	ial Resul	ts: Yes		
Batch ID:	18-0	0642-2767	Test	Type:	Reproduction-S	urvival (7d)		Anal	vst:			
Start Date		lul-17 11:18		ocol:	EPA/821/R-02-			Dilu	•	aboratory Wat	ег	
		lul-17 11:11	Spec		Ceriodaphnia di	, ,		Brin		ot Applicable		
Duration:	6d		Soui		In-House Cultur			Age		24h		
Sample ID		9925-5940	Code		6B3E7784			Clie		ew England T	esting Labs	
Sample Da			Mate		WWTF Effluent			Proj	ect:			
•		lul-17 16:15	Sour		Lowell RWWU	(MA0100633	3)					
Sample A	ge: 59h		Stati	on:								
Linear Inte	erpolatio	on Options										
X Transfo	rm \	/ Transform	Seed	i	Resamples	Exp 95%	CL Meti	nod				
Linear	l	₋inear	1678	435	200	Yes	Two	-Point Interp	olation			
Test Acce	ptability	Criteria	TAC Li	mits								
Attribute		Test Stat		Upper	r Overlap	Decision						
Control Re	esp	23.3	15	>>	Yes	Passes Cr	iteria					
Point Esti	mates											
Level %	6	95% LCL	95% UCL	TU	95% LCL	95% UCL						
	.715	2.854	58.43	26.92	1,711	35.03						
	2.5											
	2.0	5.709	94.51	1.6	1.058	17.52						
Reproduc			94,51	1.6		17.52	culated Va	riate)(
•		nmary			1,058	17.52 Calc	culated Va		CV%	%Effect		
Conc-%			Count	Mean		17.52 Cald	Std Err	Std Dev	CV% 59.37%	%Effect	c	
Conc-%		nmary Code			1,058 Min	17.52 Calc			CV% 59.37% 22.15%	0.0%	×	
Conc-% 0 6.25		nmary Code	Count 10	Mean 23.3	1,058 Min 1	17,52 Calc Max 36	Std Err 4.374	Std Dev 13.83	59.37%	0.0% 42.06%	×	
Conc-% 0 6.25 12.5		nmary Code	Count 10 10	Mean 23.3 13.5	1,058 Min 1 8	17.52 Calc Max 36 18	Std Err 4.374 0.9458	Std Dev 13.83 2.991	59.37% 22.15%	0.0% 42.06% 44.21%	<	
Conc-% 0 6.25 12.5 25		nmary Code	Count 10 10	Mean 23.3 13.5 13	1,058 Min 1 8 7	17.52 Calc Max 36 18 17	Std Err 4.374 0.9458 1.135	13.83 2.991 3.59	59.37% 22.15% 27.62%	0.0% 42.06% 44.21% 47.64%	С	
Conc-% 0 6.25 12.5 25		nmary Code	Count 10 10 10 10	Mean 23.3 13.5 13 12.2	1,058 Min 1 8 7 4	17.52 Calc Max 36 18 17 18	Std Err 4.374 0.9458 1.135 1.444	13.83 2.991 3.59 4.566	59.37% 22.15% 27.62% 37.42%	0.0% 42.06% 44.21% 47.64% 38.63%		
Conc-% 0 6.25 12.5 25 50 100	tion Sun	nmary Code D	Count 10 10 10 10 10	Mean 23.3 13.5 13 12.2 14.3	1,058 Min 1 8 7 4 9	17.52 Calc Max 36 18 17 18 18	Std Err 4.374 0.9458 1.135 1.444 0.895	13.83 2.991 3.59 4.566 2.83	59.37% 22.15% 27.62% 37.42% 19.79%	0.0% 42.06% 44.21% 47.64% 38.63%		
Conc-% 0 6.25 12.5 25 50 100 Reproduct	tion Sun	nmary Code D	Count 10 10 10 10 10	Mean 23.3 13.5 13 12.2 14.3	1,058 Min 1 8 7 4 9 0	17.52 Calc Max 36 18 17 18 18	Std Err 4.374 0.9458 1.135 1.444 0.895	13.83 2.991 3.59 4.566 2.83	59.37% 22.15% 27.62% 37.42% 19.79%	0.0% 42.06% 44.21% 47.64% 38.63%	Rep 9	Rep 10
Conc-% 6.25 12.5 25 100 Reproduct	tion Sun	nmary Code D	Count 10 10 10 10 10 10 10	Mean 23.3 13.5 13 12.2 14.3 7,1	1,058 Min 1 8 7 4 9 0	17.52 Cald Max 36 18 17 18 18	Std Err 4,374 0,9458 1,135 1,444 0,895 1,224	13.83 2.991 3.59 4.566 2.83 3.872	59.37% 22.15% 27.62% 37.42% 19.79% 54.53%	0.0% 42.06% 44.21% 47.64% 38.63% 69.53%	Rep 9	Rep 10
Conc-% 0 6.25 12.5 25 50 100 Reproduct Conc-%	tion Sun	nmary Code D	Count 10 10 10 10 10 10 10 10 Rep 1	Mean 23.3 13.5 13 12.2 14.3 7.1	1,058 Min 1 8 7 4 9 0	17.52 Cald Max 36 18 17 18 18 14	Std Err 4.374 0.9458 1.135 1.444 0.895 1.224	13.83 2.991 3.59 4.566 2.83 3.872	59.37% 22.15% 27.62% 37.42% 19.79% 54.53%	0.0% 42.06% 44.21% 47.64% 38.63% 69.53%		
Conc-% 0 6.25 12.5 25 50 100 Reproduct Conc-% 0 6.25	tion Sun	nmary Code D	Count 10 10 10 10 10 10 10 10 10 34	Mean 23.3 13.5 13 12.2 14.3 7,1	1,058 Min 1 8 7 4 9 0 Rep 3 36	17.52 Calc Max 36 18 17 18 18 14 Rep 4	Std Err 4.374 0.9458 1.135 1.444 0.895 1.224 Rep 5	13.83 2.991 3.59 4.566 2.83 3.872 Rep 6	59.37% 22.15% 27.62% 37.42% 19.79% 54.53% Rep 7	0.0% 42.06% 44.21% 47.64% 38.63% 69.53% Rep 8	5	30
Conc-% 0 6.25 12.5 25 50 100 Reproduct Conc-% 0 6.25 12.5	tion Sun	nmary Code D	Count 10 10 10 10 10 10 10 10 34 17	Mean 23.3 13.5 13 12.2 14.3 7,1 Rep 2 29 14	1,058 Min 1 8 7 4 9 0 Rep 3 36 8	17.52 Calc Max 36 18 17 18 18 14 Rep 4 36 18	Std Err 4.374 0.9458 1.135 1.444 0.895 1.224 Rep 5 6 10	3.83 2.991 3.59 4.566 2.83 3.872 Rep 6	59.37% 22.15% 27.62% 37.42% 19.79% 54.53% Rep 7 24 13	0.0% 42.06% 44.21% 47.64% 38.63% 69.53% Rep 8	5 12	30 14
Reproduc Conc-% 0 6.25 12.5 25 50 100 Reproduc Conc-% 0 6.25 12.5 25	tion Sun	nmary Code D	Count 10 10 10 10 10 10 10 10 10 17 11 14	Mean 23.3 13.5 13 12.2 14.3 7.1 Rep 2 29 14 7	1,058 Min 1 8 7 4 9 0 Rep 3 36 8 14	17.52 Calc Max 36 18 17 18 18 14 Rep 4 36 18 7	Std Err 4.374 0.9458 1.135 1.444 0.895 1.224 Rep 5 6 10 17	3.83 2.991 3.59 4.566 2.83 3.872 Rep 6	59.37% 22.15% 27.62% 37.42% 19.79% 54.53% Rep 7 24 13 13	0.0% 42.06% 44.21% 47.64% 38.63% 69.53% Rep 8 32 14 15	5 12 16	14 11

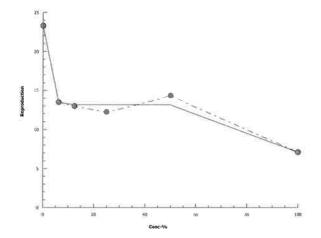
Report Date: Test Code: 18 Jul-17 09:24 (p 6 of 6) 17-1015 | 13-8504-4918

Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

Analysis ID:19-0401-1144Endpoint:ReproductionCETIS Version:CETISv1.9.2Analyzed:18 Jul-17 9:20Analysis:Linear Interpolation (ICPIN)Official Results:Yes

Graphics



Report Date:

18 Jul-17 09:24 (p 1 of 2)

	,									Test	Code	:		17-1015 13	3-8504-4918
Ceriodaphnia	7-d	Survival and	d Repro	duction Te	est								١	lew Englan	d Bioassay
Analysis ID:	12-	7790-5628	E	ndpoint:	6d S	Survival Rat	e			CET	IS Ver	sion:	CETISv	1.9.2	
Analyzed:	18	Jul-17 9:19	A	Analysis:	STF	2xK Conti	ngency Tabl	es		Offic	ial Re	sults:	Yes		
Batch ID:	18-0	642-2767	T	est Type:	Rep	roduction-S	Survival (7d)			Ana	lyst:				
Start Date:	11 J	ul-17 11:18		Protocol:		3/821/R-02-				Dilu	ent:	Labo	oratory Wa	iter	
Ending Date:	17 J	ul-17 11:11	S	Species:	Cer	iodaphnia d	ubia			Brin	e:	Not a	Applicable		
Duration:	6d		S	Source:	In-F	louse Cultu	re			Age	:	<24h	1		
Sample ID:	17-9	925-5940	C	Code:	6B3	E7784				Clie	nt:	New	England ⁻	resting Labs	3
Sample Date:	09 J	ul-17	N	/laterial:	W۷	/TF Effluen	t			Proj	ect:				
Receipt Date:	: 10 J	ul-17 16:15	S	Source:	Low	reli RWWU	(MA010063	3)							
Sample Age:	59h		S	Station:											
Data Transfor	rm		Alt Hy	р					NO	EL	LOE	ĒL	TOEL	TU	
Untransformed	d		C > T						100		> 100		n/a	1	
Fisher Exact/	Bonf	erroni-Holm	Test												
Control	vs	Group		Test \$	Stat	P-Type	P-Value	Decision	(a:5%)					
Dilution Water		6.25		1,000	0	Exact	1.0000	Non-Sign							
		12.5		0.500	0	Exact	1.0000	Non-Sign							
		25		1,000	0	Exact	1.0000	Non-Sign	ificant	Effec	t				
		50		0.500	0	Exact	1.0000	Non-Sign	ificant	Effec	t				
		100		0.500	0	Exact	1.0000	Non-Sign	ificant	Effec	t				
Data Summar	гу														
Conc-%		Code	NR	R		NR + R	Prop NR	Prop R	%E	ffect					
0		D	10	0		10	1	0	0.0	%					
6.25			10	0		10	1	0	0.0	%					
12.5			9	1		10	0.9	0.1	10.0)%					
25			10	0		10	1	0	0.0	%					
50			9	1		10	0.9	0,1	10.0)%					
100			9	1		10	0.9	0.1	10.0)%					
6d Survival R	ate D	etail						_							
Conc-%		Code	Rep 1	Rep 2	2	Rep 3	Rep 4	Rep 5	Rep	6	Rep	7	Rep 8	Rep 9	Rep 10

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1,0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1,0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	0.0000	1,0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000

6d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1

Analyst:_____ QA:____

Report Date: Test Code: 18 Jul-17 09:24 (p 2 of 2) 17-1015 | 13-8504-4918

Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

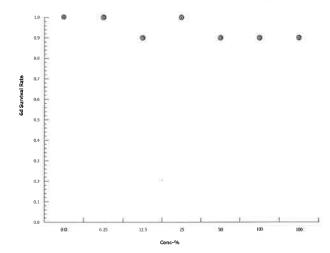
Analysis ID: 12-7790-5628

Endpoint: 6d Survival Rate

CETIS Version: CETISv1.9.2

Analyzed: 18 Jul-17 9:19 Analysis: STP 2xK Contingency Tables Official Results: Yes

Graphics



Report Date: Test Code: 18 Jul-17 09:24 (p 1 of 2) 17-1015 | 13-8504-4918

Ceriodaphnia	7-d Surv	vival and	Repro	duction Te	est							N	ew England	d Bioassa
Analysis ID:	05-2590	0-6839	E	indpoint:		duction				CETIS	Version	: CETISv	1.9.2	
Analyzed:	18 Jul-1	17 9:24		nalysis:	Paran	netric-Con	trol vs Tr	atments		Officia	al Result	s: Yes		
Batch ID:	18-0642-	-2767	Т	est Type:	Repro	duction-S	urvival (7	d)		Analys	st:			
Start Date:	11 Jul-17	7 11:18	F	rotocol:	EPA/8	321/R-02-0	013 (2002)		Diluer	nt: La	boratory Wa	ter	
Ending Date:	17 Jul-17	7 11:11	S	pecies:	Cerio	daphnia di	ubia			Brine:	. No	t Applicable		
Duration:	6d		S	ource:	In-Ho	use Cultur	e			Age:	<2	4h		
Sample ID:	17-9925-		C	ode:	6B3E					Client		w England T	esting Labs	
Sample Date:			-	laterial:		F Effluent				Projec	et:			
Receipt Date:		7 16:15		ource:	Lowel	I RWWU	(MA01006	33)						
Sample Age:	59h			tation:										
Data Transfo	rm		Alt Hy	р					NOI		LOEL	TOEL	TU	PMSD
Untransformed	t		C > T						< 6.25	5	6.25	n/a	>16	28.76%
Dunnett Multi	iple Com	parison	Test											
Control		ontrol II		Test		Critical		F P-Ty		alue	Decisio			
Dilution Water		25*		3.348		2.289		8 CDF	0.00		•	nt Effect		
		2.5*		3.519		2.289		8 CDF	0.00		•	nt Effect		
	25			3.792		2.289		8 CDF			Significa			
	50			3.075		2.289		8 CDF	0.00		Significa			
	10	00*		5.535	2	2.289	6,701	8 CDF	3,2	E-06	Significa	nt Effect		
Test Acceptal	bility Crite	eria	TAG	Limits										
Attribute		st Stat	Lower	Uppe	r (Overlap	Decisio	n						
Control Resp	23.	.3	15	>>	,	es/es	Passes	Criteria						
ANOVA Table														
Source	Su	m Squa	res	Mean	Squar	е	DF	F Sta	P-V	alue	Decision	η(α:5%)		
Between	138	86.2		277.2	4		5	6.472	8.8E	E-05	Significa	nt Effect		
					_		E 4							
Error	23	13.2		42.83	7		54							
		13.2 99.4		42.83	7		59							
Total	369			42.83	7									
Total Distributional	369	99.4		42.83	7			t Critic	al P-V	alue	Decision	n(α:1%)		
Total Distributional Attribute	369 I Tests Tes	99.4 st	uality of	42.83 Variance 1			59	t Critic				n(α:1%) Variances		
Total Distributional Attribute Variances	369 I Tests Tes Ba	99.4 st rtlett Equ	-		「est		59 Test Sta		1,4E		Unequal	<u> </u>	ion	
Total Distributional Attribute Variances Distribution	369 I Tests Tes Ba Sh	99.4 st rtlett Equ apiro-Wi	-	Variance 1	「est		59 Test Sta 40.7	15.09	1,4E	E-07	Unequal	Variances	ion	
Total Distributional Attribute Variances Distribution Reproduction	369 I Tests Tes Ba Sh	99.4 st rtlett Equ apiro-Wi	lk W No	Variance 1 irmality Te: M ean	Γest st	95% LCL	59 Test Sta 40.7 0.896	15,09 0,945 L M edi	1,4E 9 9.4E	E-07 E-05	Unequal Non-Nor Max	Variances mal Distribut Std Err	CV%	%Effec
Total Distributional Attribute Variances Distribution Reproduction Conc-% 0	369 Tests Tes Ba Sh	99.4 st rtlett Equ apiro-Wi	Count	Variance Termality Termality Mean	Fest st	3.4	59 Test Sta 40.7 0.896 95% UC 33.2	15.09 0.945 L Medi 29.5	1,4E 9 9.4E an Min 1	E-07 E-05	Unequal Non-Nor Max 36	Variances mal Distribut Std Err 4.374	CV% 59.37%	0.00%
Total Distributional Attribute Variances Distribution Reproduction Conc-% 0 6.25	369 Tests Tes Ba Sh Summar	99.4 st rtlett Equ apiro-Wi	Count 10	Variance Termality Termali	Test st	3.4 1.36	59 Test Sta 40.7 0.896 95% UC 33.2 15.64	15.09 0.945 L Medi 29.5 14	1,4E 9 9.4E an Min 1 8	E-07 E-05	Unequal Non-Nor Max 36 18	Variances mal Distribut Std Err 4.374 0.9458	CV% 59.37% 22.15%	0.00% 42.06%
Total Distributional Attribute Variances Distribution Reproduction Conc-% 0 6.25 12.5	369 Tests Tes Ba Sh Summar	99.4 st rtlett Equ apiro-Wi	Count 10 10	Variance Termality Termali	Fest st 9	3.4 1.36 0.43	59 Test Sta 40.7 0.896 95% UC 33.2 15.64 15.57	15.09 0.945 L Medi 29.5 14 14	1.4E 9 9.4E an Min 1 8 7	E-07 E-05	Unequal Non-Nor Max 36 18	Std Err 4.374 0.9458 1.135	CV% 59.37% 22.15% 27.62%	0.00% 42.06% 44.21%
Total Distributional Attribute Variances Distribution Reproduction Conc-% 0 6.25 12.5 25	369 Tests Tes Ba Sh Summar	99.4 st rtlett Equ apiro-Wi	Count 10 10 10	Variance Tormality Termality Termali	Fest st 9 9 1 1 1 1 1 8	3.4 1.36 0.43 3.934	59 Test Sta 40.7 0.896 95% UC 33.2 15.64 15.57 15.47	15.09 0,945 L Medi 29.5 14 14 13	1.4E 9 9.4E an Min 1 8 7 4	E-07 E-05	Max 36 18 17	Std Err 4.374 0.9458 1.135 1.444	CV% 59.37% 22.15% 27.62% 37.42%	0.00% 42.06% 44.21% 47.64%
Total Distributional Attribute Variances Distribution Reproduction Conc-% 0 6.25 12.5 25 50	369 Tests Tes Ba Sh Summar	99.4 st rtlett Equ apiro-Wi	Count 10 10 10 10 10	Variance Tormality Test Mean 23.3 13.5 13 12.2 14.3	Fest st 9 9 1 1 1 1 8 8 1 1	3.4 1.36 0.43 3.934 2.28	59 Test Sta 40.7 0.896 95% UC 33.2 15.64 15.57 15.47 16.32	15.09 0.945 L Medi 29.5 14 14 13 15	1.4E 9 9.4E an Min 1 8 7 4 9	E-07 E-05	Unequal Non-Nor Max 36 18 17 18	Std Err 4.374 0.9458 1.135 1.444 0.895	CV% 59.37% 22.15% 27.62% 37.42% 19.79%	0.00% 42.06% 44.21% 47.64% 38.63%
Total Distributional Attribute Variances Distribution Reproduction Conc-% 0 6.25 12.5 25 50 100	369 Tests Ba Sh Summar Co D	99.4 st rtlett Equ apiro-Wi	Count 10 10 10	Variance Tormality Termality Termali	Fest st 9 9 1 1 1 1 8 8 1 1	3.4 1.36 0.43 3.934	59 Test Sta 40.7 0.896 95% UC 33.2 15.64 15.57 15.47	15.09 0,945 L Medi 29.5 14 14 13	1.4E 9 9.4E an Min 1 8 7 4	E-07 E-05	Max 36 18 17	Std Err 4.374 0.9458 1.135 1.444	CV% 59.37% 22.15% 27.62% 37.42%	0.00%
Total Distributional Attribute Variances Distribution Reproduction Conc-% 0 6.25 12.5 25 50 100 Reproduction	369 I Tests Tests Ba Sh I Summan Co D	st rtlett Equ apiro-Wi	Count 10 10 10 10 10 10 10 10 10	Variance Tormality Tes Mean 23.3 13.5 13 12.2 14.3 7.1	Fest st 9 1 1 1 8 8 1 4	3.4 1.36 0.43 3.934 2.28	59 Test Sta 40.7 0.896 95% UC 33.2 15.64 15.57 15.47 16.32 9.87	15.09 0.945 L Medi 29.5 14 14 13 15 7	1.4E 9 9.4E an Min 1 8 7 4 9 0	E-07 E-05	Unequal Non-Nor Max 36 18 17 18 18	Std Err 4.374 0.9458 1.135 1.444 0.895 1.224	CV% 59.37% 22.15% 27.62% 37.42% 19.79% 54.53%	0.00% 42.06% 44.21% 47.64% 38.63% 69.53%
Total Distributional Attribute Variances Distribution Reproduction Conc-% 0 6.25 12.5 25 50 100 Reproduction	Tests Tests Ba Sh Summan Co D	st rtlett Equ apiro-Wi	Count 10 10 10 10 10 10 10	Variance Tormality Ter Mean 23.3 13.5 13 12.2 14.3 7.1	Fest st 9 1 1 1 8 1 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1	3.4 1.36 0.43 3.934 2.28 3.33	759 Test Sta 40.7 0.896 95% UC 33.2 15.64 15.57 15.47 16.32 9.87 Rep 4	15.09 0.945 L Medi 29.5 14 14 13 15 7	1.4E 9 9.4E an Min 1 8 7 4 9 0	E-07 E-05	Max 36 18 17 18 14	Std Err 4.374 0.9458 1.135 1.444 0.895 1.224 Rep 8	CV% 59.37% 22.15% 27.62% 37.42% 19.79% 54.53%	0.00% 42.06% 44.21% 47.64% 38.63% 69.53%
Total Distributional Attribute Variances Distribution Reproduction Conc-% 0 6.25 12.5 25 50 100 Reproduction Conc-% 0 Conc-% 0	369 I Tests Tests Ba Sh I Summan Co D	st rtlett Equ apiro-Wi	Count 10 10 10 10 10 10 10 10 34	Variance Tormality Tes Mean 23.3 13.5 13 12.2 14.3 7.1 Rep 2	Fest st 9 9 1 1 1 1 8 8 1 4 4 2 2 F 5 3	3.4 1.36 0.43 3.934 2.28 3.33	759 Test Sta 40.7 0.896 95% UC 33.2 15.64 15.57 15.47 16.32 9.87 Rep 4 36	15.09 0.945 L Medi 29.5 14 13 15 7 Rep 9	1.4E 9 9.4E an Min 1 8 7 4 9 0	E-07 E-05	Max 36 18 17 18 18 14 Rep 7	Std Err 4.374 0.9458 1.135 1.444 0.895 1.224 Rep 8	CV% 59.37% 22.15% 27.62% 37.42% 19.79% 54.53% Rep 9	0.00% 42.06% 44.21% 47.64% 38.63% 69.53% Rep 10
Total Distributional Attribute Variances Distribution Reproduction Conc-% 0 6.25 12.5 25 50 100 Reproduction Conc-% 0 6.25 100 Conc-% 0 6.25	Tests Tests Ba Sh Summan Co D	st rtlett Equ apiro-Wi	Count 10 10 10 10 10 10 10 10 17 10 10 10 10 10 10	Wariance Tormality Termality Termali	Fest st	3.4 1.36 0.43 3.934 2.28 3.33 Rep 3	759 Test Sta 40.7 0.896 95% UC 33.2 15.64 15.57 15.47 16.32 9.87 Rep 4 36 18	15.09 0.945 L Medi 29.5 14 13 15 7 Rep 9 6 10	1.4E 9 9.4E an Min 1 8 7 4 9 0	E-07 E-05	Max 36 18 17 18 18 14 Rep 7 24	Std Err 4.374 0.9458 1.135 1.444 0.895 1.224 Rep 8 32 14	CV% 59.37% 22.15% 27.62% 37.42% 19.79% 54.53% Rep 9 5 12	0.00% 42.06% 44.21% 47.64% 38.63% 69.53% Rep 10
Total Distributional Attribute Variances Distribution Reproduction Conc-% 0 6.25 12.5 25 50 100 Reproduction Conc-% 0 6.25 12.5 25 100 100 100 100 100 100 100	Tests Tests Ba Sh Summan Co D	st rtlett Equ apiro-Wi	Count 10 10 10 10 10 10 10 10 17 10 10 10 10 10 10 10 10 10	Variance Tormality Termality Termali	Fest st	3.4 1.36 0.43 3.934 2.28 1.33 Rep 3	59 Test Sta 40.7 0.896 95% UC 33.2 15.64 15.57 15.47 16.32 9.87 Rep 4 36 18 7	15.09 0.945 L Medi 29.5 14 13 15 7 Rep 8 6 10 17	1.4E 9 9.4E an Min 1 8 7 4 9 0	E-07 E-05	Max 36 18 17 18 18 14 Rep 7 24 13 13	Std Err 4.374 0.9458 1.135 1.444 0.895 1.224 Rep 8 32 14 15	CV% 59.37% 22.15% 27.62% 37.42% 19.79% 54.53% Rep 9 5 12 16	0.00% 42.06% 44.21% 47.64% 38.63% 69.53% Rep 10 30 14
Conc-% 0 6.25 12.5 25 50 100 Reproduction Conc-% 0 6.25 12.5	Tests Tests Ba Sh Summan Co D	st rtlett Equ apiro-Wi	Count 10 10 10 10 10 10 10 10 17 10 10 10 10 10 10	Wariance Tormality Termality Termali	Fest st	3.4 1.36 0.43 3.934 2.28 3.33 Rep 3	759 Test Sta 40.7 0.896 95% UC 33.2 15.64 15.57 15.47 16.32 9.87 Rep 4 36 18	15.09 0.945 L Medi 29.5 14 13 15 7 Rep 9 6 10	1,4E 9 9.4E an Min 1 8 7 4 9 0 Rep 1 15 16 4	E-07 E-05	Max 36 18 17 18 18 14 Rep 7 24 13 13 14	Std Err 4.374 0.9458 1.135 1.444 0.895 1.224 Rep 8 32 14 15 15	CV% 59.37% 22.15% 27.62% 37.42% 19.79% 54.53% Rep 9 5 12	0.00% 42.06% 44.21% 47.64% 38.63% 69.53% Rep 10
Total Distributional Attribute Variances	Tests Tests Ba Sh Summan Co D	st rtlett Equ apiro-Wi	Count 10 10 10 10 10 10 10 10 17 10 10 10 10 10 10 10 10 10	Variance Tormality Termality Termali	Fest st 9 9 1 1 1 8 8 1 4 4 4 8 8 1 1 1 1	3.4 1.36 0.43 3.934 2.28 1.33 Rep 3	59 Test Sta 40.7 0.896 95% UC 33.2 15.64 15.57 15.47 16.32 9.87 Rep 4 36 18 7	15.09 0.945 L Medi 29.5 14 13 15 7 Rep 8 6 10 17	1.4E 9 9.4E an Min 1 8 7 4 9 0	E-07 E-05	Max 36 18 17 18 18 14 Rep 7 24 13 13	Std Err 4.374 0.9458 1.135 1.444 0.895 1.224 Rep 8 32 14 15	CV% 59.37% 22.15% 27.62% 37.42% 19.79% 54.53% Rep 9 5 12 16	0.00% 42.06% 44.21% 47.64% 38.63% 69.53% Rep 10 30 14

002-570-915-7 CET**\\$**¹\\$f\\$269.2.4 Analyst:_____ QA:____

Report Date: Test Code:

18 Jul-17 09:24 (p 2 of 2) 17-1015 | 13-8504-4918

Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

Analysis ID: 18 Jul-17 9:24 Analyzed:

05-2590-6839

Endpoint: Reproduction Analysis:

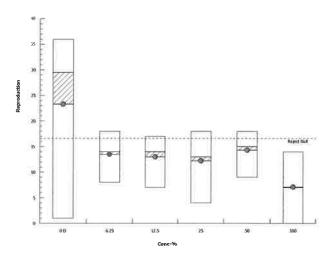
Parametric-Control vs Treatments

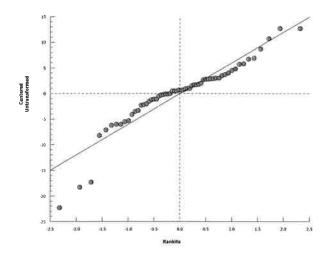
CETIS Version:

CETISv1.9.2

Official Results: Yes

Graphics





NEB'S DATA SHEET FOR ROUTINE CHEMICAL AND PHYSICAL DETERMINATIONS

FACILITY NAME & A				Utilities First Street Boulevard, Lowell, MA 01850				
NEB PROJECT NUME			5.0044476.0		TEST ORC			iodaphnia dubia
DILUTION WATER S		т	ry Synthetic	r -	START DA		7/11/17	TIME: 1118
ANALYST	TBP	KO	СВ	ZM	TBP	СВ	1	
NEB Lab Synthetic Diluent	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.3	25.1	25.4	24.9	25.0	24.9		
D.O. mg/L Initial	7.1	8.2	8.1	8.4	8.2	8.2		
pH s.u. Initial	7.1	7.3	7.6	7.4	7.8	7.7		
Conductivity µS Initial	178	178	176	178	177	178		
Temp °C Final	24.7	24.0	24.7	25.2	24.8	25.6		
D.O. mg/L Final	8.7	9.0	8.2	9.2	8.3	8.5		
pH s.u. Final	8.0	8.6	7.6	8.0	8.0	7.7		
Conductivity µS Final	194	195	210	196	199	196		
Merrimack River Control	1	2	3	4	5	6	7	Remarks
Temp °C Initial	26.0	25.1	25.2	24.8	24.9	25.8		
D.O. mg/L Initial	7.6	8.2	9.2	8.6	8.4	8.5		
pH s.u. Initial	7.1	7.4	7.6	7.5	7.9	7.7		
Conductivity µS Initial	126	132	153	151	165	166		
Гетр °С Final	25.0	24.0	24.7	25.3	24.9	25.7		
D.O. mg/L Final	8.8	9.0	8.3	9.1	8.3	8.6		
oH s.u. Final	8.1	8.7	7.6	8.3	7.9	7.8		
Conductivity µS Final	147	143	182	169	190	189		
6.25%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.7	25.2	25.3	24.7	25.2	25.2		
D.O. mg/L Initial	7.1	8.5	8.2	9.1	8.2	8.2		
oH s.u. Initial	7.1	7.3	7.6	7.3	7.7	7.6		
Conductivity µS Initial	222	225	228	225	231	222		
Гетр °C Final	24.9	24.0	24.6	25.4	24.7	25.8		
D.O. mg/L Final	8.7	8.9	8.3	9.6	8.3	8.6		
oH s.u. Final	8.0	8.7	7.6	9.0	7.8	7.7		
Conductivity µS Final	238	235	245	246	243	239		
12.5%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.7	25.2	25.2	25.0	25.2	25.2		
D.O. mg/L Initial	7.1	8.3	8.3	8.6	8.2	8.2		
oH s.u. Initial	7.1	7.3	7.6	7.3	7.7	7.6		
Conductivity µS Initial	262	267	279	275	256	257		
remp °C Final	24.9	24.0	24.4	25.3	24.6	25.7		
D.O. mg/L Final	9.0	9.5	8.5	9.7	8.4	8.6		
oH s.u. Final	8.3	8.8	7.7	9.1	7.9	7.8		
Conductivity µS Final	272	277	291	290	268	273		

NEB'S DATA SHEET FOR ROUTINE CHEMICAL AND PHYSICAL DETERMINATIONS

FACILITY NAME & A								
NEB PROJECT NUME			5.0044476.0		TEST ORC			iodaphnia dubia
DILUTION WATER S	1		ry Synthetic S		START DA		7/11/17	Ť
25%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.9	25.1	25.3	25.2	25.3	25.3		
D.O. mg/L Initial	7.2	8.2	8.4	8.4	8.3	8.2		
pH s.u. Initial	7.1	7.3	7.5	7.3	7.6	7.5		* technician error
Conductivity µS Initial	*	359	387	371	340	341		data not recorded
Temp °C Final	24.8	24.0	24.5	25.3	24.6	26.0		
D.O. mg/L Final	9.1	9.3	8.5	9.6	8.4	8.7		
pH s.u. Final	8.3	8.6	7.7	8.8	7.8	7.8		
Conductivity µS Final	369	370	399	380	358	357		
50%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.9	25.2	25.2	25.2	25.3	25.5		
D.O. mg/L Initial	7.3	8.2	8.8	8.4	8.3	8.2		
pH s.u. Initial	7.1	7.3	7.5	7.2	7.4	7.4		
Conductivity µS Initial	530	521	583	596	517	511		
Temp °C Final	24.8	24.0	24.5	25.1	24.5	26.0		
D.O. mg/L Final	9.0	9.2	8.4	9.3	8.3	8.7		
pH s.u. Final	8.2	8.5	7.8	8.8	7.8	7.8		
Conductivity µS Final	523	524	592	591	527	517		
100%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	26.0	25.1	25.1	25.3	25.0	26.0		
D.O. mg/L Initial	7.8	8.3	9.5	8.6	8.4	8.2		
pH s.u. Initial	6.9	7.2	7.3	7.1	7.3	7.2		
Conductivity µS Initial	888	875	1,013	1,012	858	845		
Temp °C Final	24.9	24.0	24.5	25.1	24.7	26.0		
D.O. mg/L Final	9.0	9.5	8.4	9.3	8.3	8.8		
pH s.u. Final	8.2	8.5	8.1	8.8	7.8	7.9		
Conductivity µS Final	868	879	1,002	985	858)	845		
• •	1	2	3	4	5	6	7	Remarks
Гетр °С Initial								
O.O. mg/L Initial								
oH s.u. Initial								
Conductivity µS Initial								
Гетр °С Final								
D.O. mg/L Final								
oH s.u. Final								
Conductivity µS Final								

NEW ENGLAND BIOASSAY INITIAL CHEMISTRY DATA

CLIENT:		NET - Lowell RWF	
NEB JOB #		05.0044476.00	
TEST ID#	C.dubia	17-1015	

DATE RECEIVED	7/10	0/17	7/1:	2/17	7/14	4/17
SAMPLE TYPE:	EFF #1	RIVER #1	EFF #2	RIVER #2	EFF #3	RIVER #3
COC#	C37-2675	C37-2676	C37-2724	C37-2725	C37-2784	C37-2785
pH (SU)	6.4	6.4	6.6	6.8	6.4	7.0
Temperature (⁰ C)	5.1	3.8	3.1	3.1	2.4	3.5
Dissolved Oxygen (mg/L)	9.9	9.9	9.6	9.2	10.6	10.8
Conductivity (µmhos)	896	126	1,017	151	884	170
Salinity (ppt)	<1	<1	<1	<1	< 1	< 1
TRC - DPD (mg/L)	0.010	0.012	0.018	0.017	0.016	0.024
TRC - Amperometric (mg/L)	N/A	N/A	N/A	N/A	N/A	N/A
Hardness (mg/L as CaCO ₃)	70	18	74	18	62	20
Alkalinity (mg/l as CaCO ₃)	55	10	80	10	35	15
Tech Initials	PD	PD	ZM	ZM	CW	CW

NOTE: NA = NOT APPLICABLE

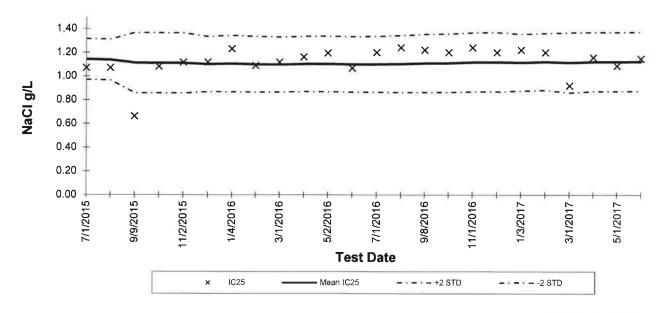
ta Reviewed By: Date Reviewed

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Project #	Symbols (✓ / P)	(Y/N)	Time period, neonates released	Collection date / time
0850801	Т	4	7-9-17/1630 -> 7-9-17/1950	7-10-17 / 1330
0644476	Т	У	7-10-17/2145 ->7-11-17/0630	7-11-17/1045
	Т	r		
	Т			
	т			
	т			

New England Bioassay Reference Toxicant Data: Ceriodaphia dubia Chronic Reproduction IC25

Reference Toxicant: Sodium chloride Test Dates: July 2015 - July 2017



								CV National	CV National
Test ID	Date	IC ₂₅	Mean IC ₂₅	STD	-2STD	+2STD	CV	75th%	90th%
15-955	7/1/2015	1.07	1.14	0.09	0.97	1.32	0.07	0.45	0.62
15-1211	8/3/2015	1.07	1.14	0.09	0.97	1.31	0.08	0.45	0.62
15-1375	9/9/2015	0.66	1.11	0.13	0.86	1,37	0.11	0.45	0.62
15-1540	10/1/2015	1.08	1.11	0.13	0.86	1,37	0.11	0.45	0.62
15-1691	11/2/2015	1.12	1.11	0.13	0.86	1.36	0:11	0.45	0.62
15-1897	12/28/2015	1.12	1.10	0.12	0.87	1.33	0.11	0.45	0.62
16-37	1/4/2016	1.23	1.11	0.12	0.87	1.34	0.11	0.45	0.62
16-138	2/1/2016	1.09	1.10	0.12	0.87	1.34	0.11	0.45	0.62
16-307	3/1/2016	1.12	1,:10	0.12	0.87	1.33	0.11	0.45	0.62
16-463	4/1/2016	1.16	1.10	0.12	0.87	1.34	0.11	0.45	0.62
16-596	5/2/2016	1.19	1.10	0.12	0.87	1.34	0.11	0.45	0.62
16-707	6/1/2016	1.07	1,10	0.12	0.87	1.34	0.11	0.45	0.62
16-880	7/1/2016	1.20	1.10	0.12	0.87	1.34	0.11	0.45	0.62
16-1212	8/24/2016	1.24	1,10	0.12	0.86	1.34	0.11	0.45	0.62
16-1258	9/8/2016	1.22	1.11	0.12	0.87	1,.35	0.11	0.45	0.62
16-1553	10/24/2016	1.20	1.11	0.12	0.87	1.36	0.11	0.45	0.62
16-1592	11/1/2016	1.24	1.12	0.12	0.87	1.37	0.11	0.45	0.62
16-1734	12/1/2016	1.20	1.12	0.13	0.87	1.37	0.11	0.45	0.62
17-14	1/3/2017	1.22	1.12	0.12	0,88	1.36	0.11	0.45	0.62
17-151	2/1/2017	1.20	1.12	0.12	0.88	1.36	0.11	0.45	0.62
17-267	3/1/2017	0.92	1 _∞ 12	0.13	0.86	1.37	0.11	0.45	0.62
17-480	4/3/2017	1.16	1.12	0.12	0.87	1.37	0.11	0.45	0.62
17-616	5/1/2017	1.09	1.12	0.12	0.88	1.37	0.11	0.45	0.62
17-972	7/5/2017	1.15	1.13	0.12	0.88	1.37	0,11	0.45	0.62

Work Order: 7G10069 Date: 8/11/2017 11:25:47AM

Results:

Sample: Plt Eff

7G10069-01 (Water)

General Chemistry

	Result	Reporting	Units	Date
		Limit		Analyzed
Alkalinity as CaCO3	56	2	mg/L	07/13/17
Ammonia	3.6	0.1	mg/L	07/13/17
pH	6.9	0.1	SU	07/10/17 18:00
Specific Conductance	856	1	uS/cm	07/14/17
Total Dissolved Solids	468	10	mg/L	07/11/17
Total Organic Carbon	6.6	1.0	mg/L	07/17/17
Total Residual Chlorine	0.12	0.01	mg/L	07/11/17 11:06
Total solids (TS)	484	10	mg/L	07/11/17
Total Suspended Solids	5	2	mg/L	07/11/17

Total Metals

	Result	Reporting Limit	Units	Date Analyzed
Calcium	22.8	0.01	mg/L	07/13/17
Magnesium	3.86	0.01	mg/L	07/13/17
Cadmium	ND	0.0001	mg/L	07/12/17
Lead	ND	0.0002	mg/L	07/13/17
Aluminum	0.081	0.012	mg/L	07/13/17
Copper	0.009	0.005	mg/L	07/13/17
Nickel	0.003	0.001	mg/L	07/13/17
Zinc	0.059	0.005	mg/L	07/13/17
Total Hardness	72.9	0.0312	mg/L	07/13/17

Sample: Receiving Water 7G10069-02 (Water)

General Chemistry

•	Result	Reporting Limit	Units	Date Analyzed
Alkalinity as CaCO3	7	2	mg/L	07/13/17
Ammonia	0.2	0.1	mg/L	07/13/17
pH	7.2	0.1	SU	07/10/17 18:00
Specific Conductance	118	1	uS/cm	07/14/17
Total Dissolved Solids	72	10	mg/L	07/11/17
Total Organic Carbon	4.6	1.0	mg/L	07/17/17
Total Residual Chlorine	0.02	0.01	mg/L	07/11/17 11:06
Total solids (TS)	92	10	mg/L	07/11/17
Total Suspended Solids	2	2	mg/L	07/11/17

Work Order: 7G10069 Date: 8/11/2017 11:25:47AM

Sample: Receiving Water (Continued) 7G10069-02 (Water)

Total Metals

	Result	Reporting Limit	Units	Date Analyzed
Calcium	5.20	0.01	mg/L	07/13/17
Magnesium	0.93	0.01	mg/L	07/13/17
Cadmium	ND	0.0001	mg/L	07/12/17
Lead	0.003	0.0002	mg/L	07/13/17
Aluminum	0.344	0.012	mg/L	07/13/17
Copper	0.005	0.005	mg/L	07/13/17
Nickel	0.002	0.001	mg/L	07/13/17
Zinc	0.024	0.005	mg/L	07/13/17
Total Hardness	16.8	0.0312	mg/L	07/13/17

NEW ENGLAND BIOASSA	Y CHAIN-OF-CUSTODY
EFFLUENT Sample Set #1	RECEIVING WATER
Sampler: 5TN BOX MGOWAN	Sampler: THOUSE KAWA
Title:	Sampler: THOMAC & KAWA Title: Ops superinferen
Facility: Lowell Regional Wastewater Utilities	Facility: Lowell Regional Wastewater Utilities
Sampling Method: X Composite	Sampling Method: X Grab
Sample ID:	Sample ID: Merrimack River
Start Date: 07-09-2011 Time:	Date Collected: 7-10-2017
Sample ID:	Date Collected: $9-10-2017$ Time Collected: $9-35An$
Sampling Method: Grab (for pH and TRC only)	ate:
Date Collected:	E + - +
Time Collected:	ுக் உத்திர _{ு இத}
	η () () () () () () () () () (
Sample Type: X Prechlorinated Dechlorinated Unchlorinated Chlorinated Chlorinated Dechlorinated Dechlorinated Chlorinated Chlorinated Dechlorinated D	nos gros
Receiving Water Sampling Location and Procedures: Merrimack (Rt.38)	River upstream of the plant discharge at the Hunts Fall Bridge,
Requested Analysis: X Chronic and modified acute	The poors a standard of the first of the fir
Sample Sh	Receive
	ipment 01
Method of Shipment: New England Testing Labs	PPU PPU
Relinquished By: Date:	7077 Time: 12-25 PW
Received By: Date:	2/10/17 Time: 12.25 /2
Relinquished By: Date:	7(10/1) Time: 310 p2
Received By: Date:	7-10-17 Time: 15/0
Relinquished By: Date: 7	70-17. Time: /6/5
Received By: Ceuny Date:	7/10/17 Time: 16/15
FOR NEB US	SE ONLY
* Please return all ice packs NEB has provided to insure acc	
	nperature of Receiving Water Upon Receipt at Lab: 3 C
Effluent COC# <u>C37-2675</u> Re	ceiving Water COC# <u>C37-2676</u>

IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO: KIM WILLS, NEW ENGLAND BIOASSAY, 77 BATSON DRIVE, MANCHESTER CT 06042

NEW ENGLAND BIOASSAY CHAIN-OF-CUSTODY		
EFFLUENT Sample Set #2	RECEIVING WATER	
Sampler: JIN BOK MGO K	Sampler: Thomas & KAWN	
Title: / hemist	Title: Of Superinte	
Facility: Lowell Regional Wastewater Utilities	Facility: Lowell Regional Wastewater Utilities	
Sampling Method: X Composite	Sampling Method: X Grab	
Sample ID:	Sample ID: Merrimack River	
Start Date: 2-11-2017 Time: 00 = 00	Date Collected: 2 - 12 - 17	
End Date: 7-11-2017 Time: 24=0	Date Collected: $\frac{7 - 12 - 17}{4 = 50.6}$	
Sampling Method: Grab (for pH and TRC only) Date Collected:		
Time Collected:		
Sample Type: X Dechlorinated Unchlorinated Chlorinated		
Effluent Sampling Location and Procedures: Plant outfall after of	echlorination. 24 hr. composite.	
Receiving Water Sampling Location and Procedures: Merrimack (Rt.38)	River upstream of the plant discharge at the Hunts Fall Bridge,	
Requested Analysis: X Chronic and modified acute		
Sample S	hipment	
Method of Shipment: New England Testing Labs		
Relinquished By: Date:	7-12-17 Time: //:2/	
Received By: Date:	7.12.17 Time: 1125	
Relinquished By: Date:	71217 Time: 1500	
Received By: Date:	7.12,77 Time: 1530	
Relinquished By: Date:_	7:12.17 Time: 16/7	
Received By: Date:	7/12/17 Time: 1617	
FOR NEB U	SE ONLY	
* Please return all ice packs NEB has provided to insure ac	curate temperature upon receipt to the NEB laboratory *	
Temperature of Effluent Upon Receipt at Lab: 3. °C	emperature of Receiving Water Upon Receipt at Lab: 3.1 °C	
Effluent COC# <u>(37-2724</u> R	Leceiving Water COC# <u>C31 2125</u>	

IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO: KIM WILLS, NEW ENGLAND BIOASSAY, 77 BATSON DRIVE, MANCHESTER CT 06042

NEW ENGLAND BIOASSA	Y CHAIN-OF-CUSTODY
EFFLUENT Sample Set # 3	RECEIVING WATER
Sampler: JIN-BOK MCGOWAU Title: CHEM 157	Sampler: Tromps E KAWA
Title: CHEM 157	Title: Ops superintena
Facility: Lowell Regional Wastewater Utilities	Facility: Lowell Regional Wastewater Utilities
Bowon Regional Wasiewater Offices	Lower Regional Wastewater Offices
Sampling Method: X Composite	Sampling Method: X Grab
Sample ID:	Sample ID: Merrimack River
Start Date: 7-13-12 Time: 00 = 00	Date Collected: $7-14-17$
End Date: 2-13-17 Time: 24-20	Date Collected: $7-14-17$ Time Collected: $7-\infty A M$
745-17	7
Sampling Method: Grab (for pH and TRC only)	
Date Collected:	
Time Collected:	
Sample Type: Prechlorinated	
X Dechlorinated Unchlorinated	
Chlorinated	
	
Effluent Sampling Location and Procedures: Plant outfall after de	chlorination. 24 hr. composite.
Receiving Water Sampling Location and Procedures: Merrimack I	River upstream of the plant discharge at the Hunts Fall Bridge,
(Rt.38)	
·	
Requested Analysis: X Chronic and modified acute	Received
	ONICE
Sample Sh	
Mala Logica and National Laboratory	
Method of Shipment: New England Testing Labs	11-151
Relinquished By: Date:	7/08/17 Time: / = 40 Am
Received By: Date:	1/14/17 Time: 11:40an
Relinquished By: Date:	7/14/17 Time: 302
Received By: Mike Hod & Date:	7-14-14 Time: 1500
Relinquished By: White Hold Date:	71-14-17 Time: 1605
	7 14 17 Time: 1405
Received By: Date:	// (4/11/) Time: (40.)
FOR NEB US	E ONI V
* Please return all ice packs NEB has provided to insure acc	
Temperature of Effluent Upon Receipt at Lab: 24 °C Temperature	nperature of Receiving Water Upon Receipt at Lab: 3.5 °C
1011 0001	ceiving Water COC# (137-2785)

IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO: KIM WILLS, NEW ENGLAND BIOASSAY, 77 BATSON DRIVE, MANCHESTER CT 06042